Development of an Antimicrobial Management (Stewardship) Program

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Background

- IDSA/SHEA recommendations
  - Stewardship team
  - 2 core strategies
    - Prospective audit with intervention and feedback
    - Formulary restriction and preauthorization
  - Supplemental strategies
    - Examples: education, guidelines and pathways, order forms, de-escalation therapy, dose optimization, IV to PO conversions, computer-based surveillance

Laying the Groundwork

- **Evaluate current stewardship efforts**
- Anti-infective expenditure analysis
- Development of a stewardship website
- Implementation of real-time surveillance system
- Business plan

Current Stewardship Efforts

Core Strategies

- Prospective audit
  - Clinical pharmacists and clinical specialists
- Formulary restrictions
  - Pre-printed order forms
  - Infectious diseases consult required
  - Location, service, age, indication

Current Stewardship Efforts

Supplemental Strategies

- Order forms (71)
  - CAP
  - HAP/VAP/HCAP
  - Admission, post-op, transfer, discharge (vaccines)
  - Ertapenem
  - Voriconazole
  - Febrile neutropenia
  - Cystic fibrosis
- IV to PO conversions
- Infection control efforts
- Optimization of dosing
  - Pharmacy on-call program
  - Pharmacokinetic consults
    - Vancomycin
    - Aminoglycosides
  - Meropenem ATS program

Analysis of Azole Antifungal IV to PO Program

- Objectives
  - Evaluate the success of the current process for conversion of IV to PO therapy for both fluconazole and voriconazole at the MUSC Medical Center
  - Determine what the impact on anti-fungal therapy costs has been since the IV to PO conversion program was introduced in 2003

Analysis of Azole Antifungal IV to PO Program

- Retrospective utilization data for IV and PO fluconazole and voriconazole
- IV to PO ratios calculated
  - Quarterly
  - January 2003 to October 2007
- Institution specific prices used to calculate cost savings
- The program has saved $3,710.33 per 1000 patient days since 2003
- Total savings = $1.8 Million

Meropenem ATS

- Objective
  - Evaluate our compliance with the current automatic therapeutic substitution
  - Provide information to department of pharmacy on current practice and recommendations for improvement if necessary

Meropenem ATS

- ATS protocol
  - Orders written for meropenem 1 g IV q8h will be changed to meropenem 500 mg IV q6h
  - Implemented to reduce antimicrobial dose for patients and documented equivalence to 1 g IV q8h
- Exceptions
  - CNS infection
  - Cystic fibrosis
  - Febrile neutropenia
  - Renal function

Meropenem ATS

- Methods
  - Retrospective chart review is ongoing for all meropenem 1g IV q8h orders processed March 2008
- Data collection
  - Age, race, sex, SCr on day of therapy initiation, calculated modified GFR

Meropenem ATS

(Preliminary Results)

	Meropenem 1 g IV q8h (N = 22)
Female # (%)	7 (33)
White # (%)	14 (66)
Mean age yrs (range)	48 (19 – 82)
Mean modified GFR mL/min (range)	95 (41 – 120)
Appropriate Dose # (%)	10 (48) (neutropenic fever)

Laying the Groundwork

- Evaluate current stewardship efforts
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Anti-infective Expenditure Analysis

- CY 2005 compared with Y 2006
  - Total expenditure increased 47.65%
  - Compared with other institutions in the UHC network, MUSC had the largest increase in expense during this time period
- FY 2006 compared with FY 2007
  - Overlapped FY 06 by 6 months
  - Total expenditure increased only 6.8%

Anti-infective Expenditure Analysis

- Possible explanations
  - Formulary changes in the first 6 months of CY 2006
    - Caspofungin and moxifloxacin added to formulary
    - Linezolid restriction expanded to include HAP/VAP/HCAP
    - Liposomal amphotericin B restriction removed
  - Increased usage of high cost agents
  - Poor inventory management (dollars based on purchase history)
- Recommendations
  - Evaluate use of high cost agents
  - Restrict use of these agents

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MEDICAL UNIVERSITY OF SOUTH CAROLINA

ANTIMICROBIAL STEWARDSHIP PROGRAM

Welcome to the MUSC Antimicrobial Management Program Website. MUSC is currently establishing an Antimicrobial Stewardship Team which will be a team charged with carrying out the duties of antimicrobial stewardship here at MUSC.
Antimicrobial stewardship is a term used to describe specific team based initiatives that healthcare systems can enact in order to utilize ant-infective agents more appropriately. The goals of stewardship are to optimize clinical outcomes while minimizing unintended consequences of antimicrobial use, including toxicity, the selection of pathogenic organisms, and the emergence of resistance.
MUSC has several stewardship initiatives in place at this time, but we continue to strive towards stewardship excellence.
Within this website you will find current information on the following subjects:

- **Restricted antimicrobial agents with their current restrictions and process for approved use**
- **Current treatment guidelines for infectious diseases**
  - CAP
  - HAP/VAP/HCAP
  - Invasive Fungal Infections
  - Febrile Neutropenia
  - Vancomycin Use
- **Order forms**
  - CAP
  - HAP/VAP/HCAP
  - Ertapenem
  - Voriconazole
- **IV to PO program initiatives**
  - Voriconazole
  - Fluconazole
- **Pharmacokinetic consultation**
  - Ask a Pharmacist
- **Automatic Therapeutic Substitution Programs**
  - Fluoroquinolones
  - Meropenem

Laying the Groundwork

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- **Implementation of data mining system**

Safety Surveillor™ Implementation

- Web-based infection control surveillance system
  - Pharmacy
  - Microbiology
  - infection control
- Creates up to date antibiograms
- Can be used to evaluate antibiotic use trends, resistance, doses, etc
- Currently implementing

Plans for Project Completion

- Business plan to be presented to administration
- Make recommendations based on results of meropenem review
- Fully implement Safety Surveillor™
- Launch website and educate practitioners

Questions?

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